Initial Screening of Analytical Tools

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What is an Analytical Tool?

- **Numerical procedure to:**
  - Describe the physical, biological, and/or social environments
  - Allow for variable conditions to simulate changes
- **Types of analytical tools range from "spreadsheets" to complex models**

Potential Types of Analysis

- **Salton Sea hydrology, water quality, circulation, and groundwater flows that affect Salton Sea**
- **Habitat conditions and response of biological resources**
- **Economics**
  - Agricultural
  - Recreation
  - Community and regional

Hydrologic Models

- **Salton Sea Accounting Model**
- **Lake Circulation/Stratification Models**
- **Colorado River Simulation System - probably will not be used on this study**
- **Imperial Irrigation District tools**
- **Imperial Irrigation District-Imperial County Groundwater Model**
- **Coachella Valley Water District tools**

Hydrologic Models: Salton Sea Accounting Model (SSAM)

- **US Bureau of Reclamation model**
- **Available for application by Reclamation**
- **Time step = 1 Year**
- **Geographic Area = Salton Sea watershed**
- **Variables**
  - **Input: Tributary & seepage inflows & rainfall**
  - **Output: Elevation, salinity (assumes conservative mass balance), surface area (with assumed depths)**
- **Can be used to simulate multiple ponds**

Hydrologic Models: Lake Circulation and Stratification

- **Recent tools by UC Davis departments**
- **Different tools have been and continue to be developed**
  - **Three-dimensional tools: RMA-10 and SID3**
  - **More recently one-dimensional tool (DLM)**
- **Run multiple times to simulate time steps**
- **Geographic Area: applied to Salton Sea**
- **Input data limitations may limit effectiveness of projections - may be used for trend analysis**

Hydrologic Models: Colorado River Simulation System

- **US Bureau of Reclamation model**
- **Uses input from National Weather Service forecasting model and a general circulation model**
- **Projects available water supplies, stream flows, storage volumes, and salinity**
- **Probably will not be used for Salton Sea Ecosystem Plan**

Hydrologic Models: Imperial Irrigation District Tools

- **IID tools used to simulate operations, tailwater and tilewater flows, and conservative water quality constituents**
- **Must be applied by IID**
- **Geographic Area = IID service area**
- **Output Variables are used as inflows into SSAM**
- **May be needed to simulate conditions for 1,600,000 acre-foot transfer**

Hydrology: Imperial County Groundwater Model

- **Jointly developed model by IID and Imperial County to project groundwater flows**
- **Geographic Area = Imperial County**
- **Output Variables could be used as inflows into SSAM**
- **May be needed to simulate conditions for 1,600,000 acre-foot transfer**

Hydrologic Models: Coachella Valley Water District Tools

- **CVWD tools to simulate surface water and groundwater gains/losses from Salton Sea and salinity effects**
- **Must be applied by CVWD**
- **Geographic Area = CVWD service area**
- **Output Variables are used as inflows into SSAM**
- **May not be needed if no changes from No Action Alternative conditions**

Biological Response Model for Avian Resources

- **Point Reyes Bird Observatory Habitat Conversion Model**
- **GIS-based model to predict bird density and diversity based on habitat characteristics**
- **Input data for habitat and bird use may limit effectiveness of projections**
- **Could be used to compare bird use between alternatives**

Economic Models

- **IMPLAN**
  - **Available**
  - **Uses changes in agricultural and urban land uses and direct and induced effects of changes in agricultural and industrial employment to predict changes in employment**
- **USBR Economic Model**
- **Environmental Justice Model**

Summary of Initial Screening of Analytical Tools

- **Hydrology**
  - **Salton Sea Accounting Model is available and can be used for alternatives with minor changes**
  - **Lake Circulation and Stratification models may require additional development and data**
  - **Modeling may be required by IID and/or CVWD**
- **Bird Use Model may require additional data**
- **Economic Models will require input from community, districts, and stakeholders**